

REMARKS

Claims 1, 4, 6-7, 9-16, 18-23, 49 and 61-82 are pending. Claims 25-27, 30-36, 44-48 and 50-60 are newly cancelled, without prejudice to further prosecution of the subject matter of the cancelled claims. New claims 61-82 are provided.

The Examiner has rejected claims 1, 4, 6, 7, 9-16, 18-23, 25-27, 30-36 and 44-60, and has indicated (at page 19 of the Office Action) that claims 7, 9-16, 20-23, 25-27, 30-36 and 44-54 are objected to.

Reconsideration and withdrawal of all rejections is respectfully requested in view of the above-provided amendments and the following remarks.

AMENDMENTS TO THE CLAIMS

The phrase, "protein or" as an alternative embodiment to "recombinant polypeptide," is removed from claims 1 and 18, without prejudice. Claim 1 is also amended to remove the phrase, "comprising at least one conservative amino acid substitution," without prejudice.

Claims 6 and 7 have been amended to independent form.

Claim 19 is amended to recite a vaccine comprising an expression vector of claim 61.

New claims 61 through 78 are supported by the specification, and by the presently cancelled claims. For example, claims 25-27 are cancelled and replaced by new claims 64-66. Claim 30 is cancelled and replaced by new claims 76-78. Claim 31 is cancelled and replaced by new claims 73-75. Claim 59 is cancelled and replaced by new claims 67-69. Claim 60 is cancelled and replaced by new claims 70-72.

New claims 79-80 are supported by the specification at page 17, lines 16-25 of the application as filed (paragraph 0090 of the published application).

New claims 81-82 are supported by the specification at page 25, line 25, through page 26, line 22.

No new matter is added.

THE CLAIM OBJECTIONS

At page 3, lines 11-16, of the Office Action, the Examiner has objected to claim 45 under 37 CFR 1.175 as a substantial duplicate of claim 22. Claim 45 is now cancelled, thus obviating this ground of rejection.

At pages 3-4 of the Office Action, the Examiner has objected to claims 7, 9-16, 20-23, 25-27, 30-36 and 44-54 for allegedly broadening the scope of claim 1. The Examiner takes the position that when claim 1 recited, "at least one conservative amino acid," that would be interpreted to be multiple nucleic acid coding sequences, and therefore would have had a broadening effect.

Applicants respectfully disagree. Claim 1 no longer recites that the subject polypeptide comprises, "at least one conservative amino acid substitution." In addition, claim 7 is now in independent form and claim 46 is now cancelled. It is respectfully urged that this ground of objection is now obviated.

For all of these reasons, reconsideration and withdrawal of all of the above noted objections to the claims is respectfully requested.

**THE CLAIMS COMPLY WITH THE
WRITTEN DESCRIPTION REQUIREMENT
UNDER 35 USC 112, FIRST PARAGRAPH**

At page 5, line 3 through page 10, line 9 of the Office Action, claims 18-23, 25-27, 30-36, 44-45, 54 and 58-60 are rejected under 35 U.S.C. 112, first paragraph, for allegedly failing to comply with the written description requirement. If Applicants understand the Examiner's position correctly, the rejection is based upon the argument that the, "at least one conservative amino acid," of claim 1, and the, "at least 95% homology" of claims 51, 54 and 58, is not supported by written description in the specification as to the immunogenicity of the claimed vaccine.

Applicants respectfully disagree. In the interest of expeditious prosecution, claim 1 has been amended to remove the phrase permitting at least one conservative substitution, and claim 51, *et seq.*, have been cancelled, without prejudice. Thus, it is submitted that this ground of rejection is obviated.

The Examiner's attention is also respectfully directed to new claims 79-80 and 81-82. Claims 79-80 are supported, e.g., by page 17, lines 16-25 of the specification. There, it is stated that,

As used herein a polypeptide "consisting essentially of" or that "consists essentially of" a specified amino acid sequence is a polypeptide that (i) retains an important characteristic of the polypeptide comprising that amino acid sequence,

e.g., the antigenicity of at least one epitope of the ^{Ps}p45 protein, and (ii) further comprises the identical amino acid sequence, except it consists of plus or minus 10% (or a lower percentage), and preferably plus or minus 5% (or a lower percentage) of the amino acid residues. In a particular embodiment, additional amino acid residues included as part of the polypeptide are part of a linked Tag, such as a C-terminal His₆ Tag.

It is submitted that the above quoted teaching of the specification provides a clear written description of claims 79-80, which are intended to encompass polypeptides consisting essentially of the sequences of SEQ ID NO: 2 or SEQ ID NO: 4, minus 5% or a lower percentage, to encompass a C- or N-terminal truncation. This corresponds to the claimed "at least 95% of the amino acid sequence of...." Claim 80 represents a nucleic acid encoding the polypeptide of claim 79.

New claims 81-82 are supported, as above, and by page 25, line 25 through page 26, line 22, of the specification, that provides clear written description support for the nature and scope of the intended conservative amino acid substitution. In addition, as noted above, it is submitted that the functional requirement introduced as a part of the definition of "consisting essentially of" at page 17, lines 16-25, of the specification, expressly excludes inoperative embodiments.

Given the clear teachings of page 17, lines 16-25, and at page 25, line 25 through page 26, line 22 of the specification, it is submitted that the amount of variation recited by new claims 79-82 have a sufficient written description.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

**THE CLAIMS ARE ENABLED
UNDER 35 USC 112, FIRST PARAGRAPH**

At page 10 of the Office Action, claims 1, 4, 6-7, 9-16, 18-23, 25-27, 30-36 and 44-60 are rejected under 35 U.S.C. 112, as allegedly not enabled. In the paragraph bridging pages 11-12, the Examiner specifically points to claims 1, 4, 6, 30-36 and 51-53. The Examiner challenges the operability of the p45 protein as an antigen to induce immunity to *Piscirickettsia salmonis*, with the recited conservative amino acid substitutions of claim 1.

Applicants respectfully disagree. In the interest of expeditious prosecution, claim 1 has been amended, without prejudice, to remove the phrase permitting a single conservative

substitution. For this reason, this ground of rejection is obviated.

At page 12, line 3, of the Office Action, the Examiner further applies this ground of rejection to claims [51-54 and] 55-58 for reciting "95% identify." These claims are cancelled without prejudice, in the interest of expeditious prosecution, thus obviating this ground of rejection. The Examiner also re-argues these points at page 12, line 21, through page 13, line 8, of the Office Action, as to *Y. ruckerie*, without expressly mentioning particular claims. If Applicants understand the Examiner correctly, it is submitted that the above-provided amended claims, and arguments obviate this ground of rejection, as well. Otherwise, Applicants reserve the right to respond to this point further, as required.

The Examiner's attention is also respectfully directed to new claims 79-82, that are submitted to be fully supported and enabled, for all of the reasons discussed above in responding to the Written Description rejection. As noted above, given the clear teachings of page 17, lines 16-25, and at page 25, line 25 through page 26, line 22 of the specification, it is also submitted that the ordinary artisan would have no difficulty understanding and practicing the invention as claimed, without undue experimentation. Certainly, there are no facts of record to contradict the enablement of Applicants' presumptively enabled invention of claims 79-82, given the teachings of the specification.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Beginning at page 14, line 9 of the Office Action, the Examiner has rejected claims 18-23, 25-27, 30, 45, 49-50, 54 and 58-60 (vaccines) and claims 31-36 and 44 (methods of protecting a fish from SRS) under 35 U.S.C. 112, as allegedly not enabled. The Examiner takes the position that the specification fails to support the enablement of the p45 protein, and p45 protein in combination with other antigens, as a vaccine. The Examiner argues that delaying infection and reducing mortality does not meet a dictionary definition of a vaccine which, as quoted by the Office Action, at page 14, is,

A prophylactic or therapeutic material containing antigens derived from one or more pathogenic organisms which, on administration to man or animal, will stimulate active immunity and protect against infection with these or related organism (i.e. produce protective immunity).¹

¹ The Examiner cites to, The Dictionary of Immunology, Herbert *et al.* eds, Academic Press, 1995.

The Examiner argues that (bridging pages 14-15 of Office Action):

the specification teaches that a composition comprising *Y. ruckeri* comprising nucleic acid encoding the full length p45 antigen with signal peptide and oily adjuvant was effective in reducing mortality and delaying infection from *P. salmonis* infection when fish were vaccinated by injection with 0.1 mL vaccine/fish. The specification teaches that said *Yersinia ruckeri* carrying the full length p45 antigen delayed the occurrence of infection by *P. salmonis* (p. 86 lines 4-10). Thus, the specification provides for delaying of infection and reducing mortality but does not protect from infection as set forth in the definition of a vaccine and also does not correlate delaying of *P. salmonis* infection and reducing mortality with protecting any fish from salmonid rickettsial septicemia.

Applicants respectfully disagree. It is submitted, with respect, that the Examiner is taking an excessively narrow interpretation of his own dictionary definition. It is urged that the ordinary artisan, who has read the instant specification, and who has read the above-quoted dictionary definition, will appreciate that if the vaccinated fish benefit with, "delaying of infection and reducing mortality," as conceded by the Examiner, it is clear that the injected composition did in fact, "stimulate active immunity and protect against infection" as required by the dictionary definition. The Examiner is also asked to take administrative notice of the setting and conditions for the proposed vaccination. As explained by the Background section of the instant application, beginning at page 1, the intended recipients of the instant immunogenic composition are farmed fish. These are fish raised under crowded conditions, for a set duration of time before harvesting. Under these conditions, the fish are susceptible to economically significant infections. It is submitted that any delaying of infection and reduced mortality will, it is urged, in fact protect the farmed fish population, individually and collectively, from the spread and progression of the pathogen(s). Under the circumstances, it is respectfully urged that no technically credible reason has been made of record that the inventive immunogenic composition(s) cannot be described, for convenience, as a vaccine, under the quoted dictionary definition.

Further, it is well known that the patentee is his or her own lexicographer. The instant specification fully defines an inventive vaccine as including the above-discussed antigens throughout the specification.

Further still, the claims (31, 34 and 35), directed to methods of protecting fish with

express combinations of antigens, in addition to the ^{Ps}p45 recombinant polypeptide, or a ^{Ps}p45 expression vector, have been cancelled, without prejudice, thus obviating this aspect of the rejection.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

At page 15, line 1, of the Office Action, the Examiner takes the position that there is no data confirming the efficacy of inducing, "immunoprotective responses in other non-salmonid fish." The Examiner's attention is respectfully directed to claims 73, 74 and 75, which specify that the recited method is practiced with salmonid fish. It is submitted that this ground of rejection is now obviated.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

At page 15, line 17, through page 16 of the Office Action, the Examiner takes the position that IPN antigens that are not VP2 and VP3 are not enabled, in combination with the p45 antigen. The Examiner's attention is respectfully directed to claims 64, 65 and 66, which specify that the IPN antigen is VP2, VP3 or a combination thereof. It is submitted that this ground of rejection is now obviated.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

At page 16, line 17, through page 17 of the Office Action, the Examiner takes the position that no data confirming the efficacy in inducing a specific immunoprotective responses with naked DNA without a signal sequence is provided, and therefore that the specification is not enabling for claiming a nucleic acid vaccine lacking a signal sequence. The Examiner's attention is respectfully directed to claims 19 and 49. These vaccine claims depend from claims directed to, *inter alia*, nucleic acid expression vectors. It is submitted that this ground of rejection, including the arguments made on page 17, lines 4-15, is now obviated.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

**THE CLAIMS ARE DEFINITE
UNDER 35 USC 112, SECOND PARAGRAPH**

Claims 1, 4, 6-7, 9-16, 18-23, 25-27, 30-36 and 44-60 are rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner takes the position that it is not clear whether the *P. salmonis* 45 kDa p45 protein is separate from the recombinant polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 4

Applicants respectfully disagree. The Examiner's attention is respectfully directed to pending claim 1, *et seq.*, which no longer recites a, "protein or" with respect to the ^{Ps}p45 recombinant polypeptide. It is submitted that this ground of rejection is now obviated.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

THE CLAIMS ARE NOVEL UNDER 35 U.S.C. § 102(b)

At page 18-19 of the Office Action, claims 1, 46, 51, and 55 are rejected under 35 U.S.C. 102(b) as allegedly anticipated by Jones *et al.* ("Jones," Diseases of Aquatic Organisms vol. 33: 25-31, 1998). The Examiner takes the position that the variation allowed by claims 1, 51 and 55 potentially allows the claimed isolated protein to encompass the protein of Jones.

Applicants respectfully disagree. Claim 1 is now limited to a recombinant polypeptide comprising SEQ ID NO: 2 and SEQ ID NO: 4, and claims 51 and 55 are cancelled. It is submitted that Jones fails to disclose or even suggest the specific recombinant polypeptides as recited by claim 1. It is respectfully submitted that this ground of rejection is now obviated. It is also urged that the same consideration applies to each additional pending independent claim and the claims depending therefrom.

For all of the foregoing reasons, reconsideration and withdrawal of this ground of rejection is respectfully requested.

CONCLUSION

This Amendment is believed to be timely submitted with a Petition for One-Month Extension of Time, with the required fee. However, in the event that it is determined that any

additional extension of time is required, the Commissioner is authorized to treat this paper as the required petition for extension of time, and to charge any required fee to Deposit Account No. 02-2275.

Previous to the entry of the present amendment, a total of 62 claims were pending. After entry of the present amendment, a total of 41 claims, including six independent claims, are pending. Thus, it is believed an additional claim fee is due only for three independent claims, in excess of the three independent claims previously paid. The required fee for three additional independent claims is enclosed. Nevertheless, if any other fee is determined to be required for entry of this paper, that fee may also be charged to the above-mentioned Deposit Account.

Respectfully submitted,

LUCAS & MERCANTI, LLP

A handwritten signature in cursive script, appearing to read "Laurence Manber", is written over a horizontal line.

Laurence Manber

Registration No. 35,597

LUCAS & MERCANTI, LLP
475 Park Avenue South
New York, New York 10016
Phone: 212-661-8000
Fax: 212-661-8002